Floating Wetlands

Step by step building guide

Thanks to Redlands City Council for providing the information and idea for this workshop. Brisbane Land for Wildlife has adapted the presentation and measurements so that the floating wetland can be easily transported.

Many waterbodies have significant problems due to excessive nutrients and sediments. These pollutants can result in poor water quality, algal blooms, water weed outbreaks, stresses on aquatic life and ultimately the poor health of Moreton Bay. As well as improving waterway health floating wetlands also provide additional habitat for aquatic and terrestrial animals.

Step 1: Building the frame

The finished size of the floating wetland being built is constrained by the need for the frame to be easily transportable. Larger floating wetlands can be built at home using larger diameter piping (100mm stormwater PVC) that gives additional buoyancy.

Materials:

1. 4 x 750mm x 90mm stormwater PVC pipe

2. 4 x right angle 90mm joiners

3. PVC priming fluid (red) and PVC pipe cement (blue plumbers glue)

Personal Protective Equipment:

A. Eye protection - approved safety glasses or goggles

B. Gloves - chemical resistant gloves for handling priming fluid and pipe cement

C. Protective clothing - long sleeve shirt and long pants

Instructions

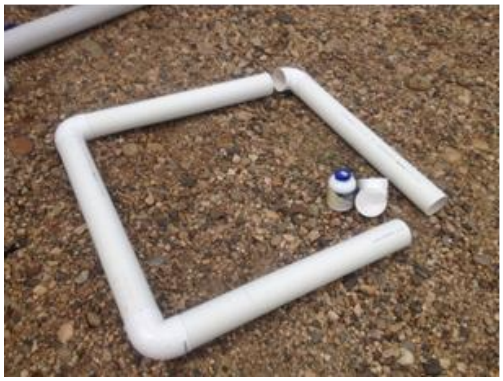
1. Collect 4x lengths of pipe and 4x elbows. Lay out flat on the ground like picture below.

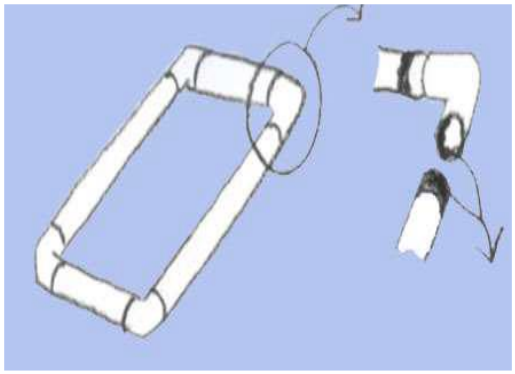
2. Apply red priming fluid to all surfaces that are to be joined. The primer allows the glue to properly bond the pieces together. Apply primer to all external PVC pipe ends to ~3cm and all internal ends of the elbows. This fluid dries very quickly.

3. Liberally apply blue glue over the primed end of one of the pipes and push an elbow over the glue. The elbow should slide about 2.5-3cm onto the pipe. The glue will set in about 15 seconds giving a watertight seal.

4. Repeat the above process until you have a rectangle that looks like the picture. (no Dr Seuss structures please!)

Note: The primer and plumbing glue are highly volatile. Make sure you are working in a well ventilated area.




Step 2: Construct the layer to hold the plants in place

Materials:

1. Shade cloth mesh (to fit your frame approximately 2.5m x 2.5m)

2. Scissors (suitable for cutting shade cloth)

3. Cable ties (200mm and 450mm lengths)

Personal Protective Equipment:

A. Eye protection approved safety glasses or goggles

B. Gloves - safety gloves for when using hand tools

C. Protective clothing long sleeve shirt and long pants

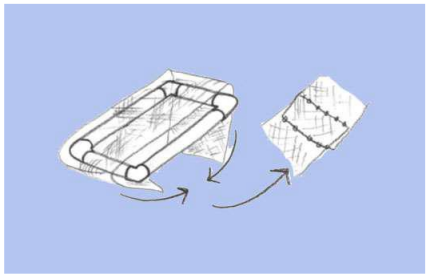
Instructions:

1. Measure and cut the plastic mesh so that it will wrap around the frame and meet with a little overlap.

2. Pull the mesh together as tight as possible and where it overlaps use cable ties to join the two loose edges of the mesh together.

3. Secure the mesh to the frame using cable ties.

Note: Adding a material such as shade cloth between the two layers of plastic mesh will provide additional surface area for biofilm growth.





Step 3: Attach geo-textile layer

Materials:

1. 1.5m x 1.5m Geo-textile (Jute mat, Recover or similar)

2. Cable ties (200mm and 450mm lengths)

3. Scissors (suitable for cutting geo-textile)

Personal Protective Equipment:

A. Eye protection approved safety glasses or goggles

B. Gloves - safety gloves for when using hand tools

C. Protective clothing long sleeve shirt and long pants

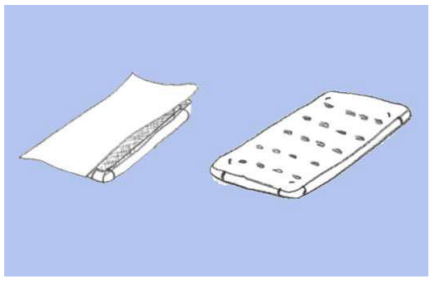
Instructions

1. Measure and cut the geo-textile so that it is slightly larger than your frame. The geo-textile layer protects plants roots from direct sunlight, captures falling organic matter and reduces weed colonization.

2. Lay the geo-textile on top of the frame. Use cable ties to secure the geo-textile to the frame.

3. With scissors cut holes in the geo-textile. These need to be slightly larger than the size of a tube stock plant. Cut enough holes to match the number of plants.

4. Cut matching holes in the top layer **only** of the plastic mesh.





What to do when you get home:

1. Plant plants in constructed frame;

2. Install bird protection if needed;

3. Launch the floating wetland and secure if needed;

4. Maintain your floating wetland.

1. Planting

Materials:

10 x Aquatic wetland plants (provided at the training workshop)

Personal Protective Equipment:

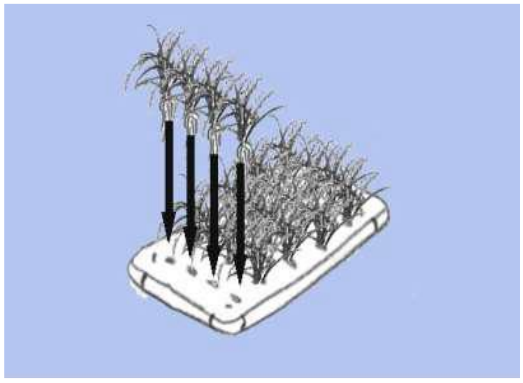
A. Gloves - safety gloves for when using hand tools

B. Protective clothing long sleeve shirt and long pants

Instructions:

1. Select locally native plants that grow well in water and will not grow too large for the floating wetland

2. Remove tube-stock from plastic pot and insert into pre-cut slots.




Additional information:

Once you have built your floating wetland, you will need to determine if you require bird protection. If you have a lot bird life on your dam, especially Purple Swamp and/or Dusky Moorehens, then you will need bird protection. Bird netting is only temporary - once the plants have matured it is removed. When choosing netting there is potential for wildlife to get caught in the netting. To minimise this risk use fauna friendly netting such as hail guard or fruit saver netting. For more information on netting, refer to www.wildlifefriendlyfencing.com.

2. Build and attach bird protection – dimensions are for the workshop constructed floating wetland.

Materials:

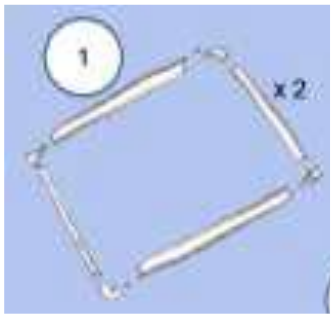
1. Cable ties (200mm and 450mm lengths)
2. Scissors (suitable for cutting bird netting)
3. 8 x 1m lengths electrical conduit (medium duty 25mm)
4. 8 x right angle electrical conduit joiners (elbow bend 25mm)
5. PVC primer and glue
6. Wildlife friendly bird netting

Personal Protective Equipment:

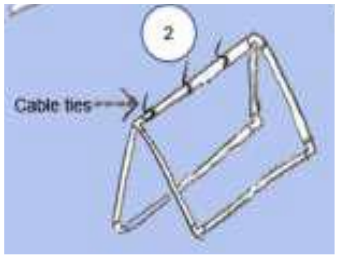
A. Eye protection approved safety glasses or goggles

B. Gloves - chemical resistant gloves for handling primer and glue and safety gloves for when using hand tools
C. Protective clothing long sleeve shirt and long pants

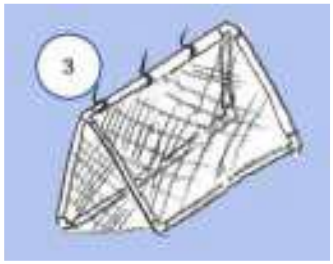
Instructions:
1. Lay out four lengths of electrical conduit and glue together with the joiners (picture 1). Repeat this process so you have two squares.



2. Secure the two squares together using cable ties (picture 2).



3. Fix the bird netting to the frame using cable ties. Make sure you pull the netting as tight as possible to prevent wildlife getting caught.



4. Fix the bird protection directly to your floating wetland using cable ties.

5. Bird netting is only required whilst plants are establishing. Once the plants have matured remove the netting.

3. Placement and securing the floating wetland

1. When siting your floating wetland ensure that the water depth is a minimum of 0.5m. This stops the plants attaching to the bed of the waterbody. The floating wetland should be placed in an area that receives sufficient sunlight, so ensuring healthiest plant growth (i.e. away from the shade of bank vegetation).

2. When placing the floating wetland, consider securing it where nutrient rich waters flow into the waterbody.

3. Floating wetlands can be secured either by tying them to a stake or tree on the bank, or by using an anchor (such as besser bricks). It is important to ensure that the wetland will float when the waterbody is at full water holding capacity. Care should be taken to ensure floating wetlands are well secured in flood prone waterbodies.

4. Floating wetland plants have an advantage over rooted wetland plants as they are not affected by water level fluctuations, so don't worry if your dam level rises and falls.

5. To achieve nutrient reduction targets, floating wetlands should cover 5% of the surface area of the waterbody. You can join and arrange several floating wetlands with synthetic rope to obtain the 5% coverage.

This wetland is not secured as there are a number of water lilies and vegetation to keep it from floating to the edge.

4. Maintenance

Inspect periodically to check for disturbance of plants and damage to bird netting in early stages.

Some long term maintenance of floating wetlands is required.

Floating wetlands can be colonised by exotic weeds, so weed control may be needed.

To remove captured phosphorous and sediments, the biofilm and root material below the floating wetland can be trimmed periodically.